

DRY ROT.

DAMP is not only a cause of decay, but essential to it; while, on the other hand, absolute wet, especially at a low temperature, prevents it. This latter must be understood to imply more than the partial immersion to which logs are usually subject; for that is a practice unquestionably injurious to the timber. Piling and planking under damp foundations, notwithstanding the incontrovertible instances which can be adduced of their long endurance, are practices decidedly bad; for the decay of the timber is little less than certain: the sinking of the superstructure must obviously keep pace with it, and the settlement being irregular, most produce fractures in the edifice. Again we say, if the wet is perfect, the result is otherwise. Old refuse-wood that has been lying about in timber yards, imbibing moisture from the earth, makes bad bearers for logs; for it is more or less decayed, and therefore infectious. To bed timbers in mortar, which is liable to continue long in a humid state, is bad; under such circumstances decay may be expected: to prevent this chance, it was enacted by the 19th Car. 2, cap. 3, that bond and plate, the ends of girders, &c., should be bedded in foam instead of mortar: it may be here remarked that sawn timbers are, in their sides, more subject to the influence of moisture than such as have been split; for, as the saw cuts through the fibres, the moisture is afforded more ready access; for this reason cleft pulcs are the most durable. Hasty finishing on damp walls delays drying, and must induce premature decay where timbers are confined: drying therefore should, in favourable weather, be accelerated by a free admission of air, and in the night by fires, but not too strong, for that would cause the wood-work to shrink and crack.

The confinement of timbers under most circumstances is attended with the worst consequences; yet a partial ventilation tends, as an able writer has expressed it, to "fan the flame" of decay, and hasten rather than prevent it: floors in general do not afford good facilities for ventilation, and are therefore very liable to decay: the joints of even well-ventilated framing frequently afford illustration of this; for when the timber has not been thoroughly seasoned, the moisture which there seeks escape, and (from the parts being neither perfectly close nor yet sufficiently open to allow dampness to evaporate) is confined, invariably induces decay. Timbering to basement floors, and in close cellars, is destroyed in a very short time.

Damp combined with warmth is, as a destroying agent, still more active than simple damp alone—the heat being understood as insufficient to carry off the moisture by evaporation; and the higher the temperature, with a corresponding degree of moisture, the more rapid the decay. The kind of composition produced in this way is called rot, and is of two kinds, distinguished as *wet rot* and *dry rot*: these proceed from the same primary causes, the difference between them being constituted by the disparity in the evaporation; where that is free, and disperses the gaseous products of the putrefaction, we have wet rot; where there is not a free circulation of pure atmospheric air, to absorb all the moisture and carry off these products, they combine in the formation of a parasitical fungus called *Boletus inchrymans*, belonging to the botanical class *cryptogamia*, and thus we have dry rot: of this serious evil it is important to be well aware.

Dry rot, externally, first makes its appearance as a mildew, or rather a delicate white vegetation, that looks like such. This stage of the disease, if not one more advanced, is almost invariably found to be arrived at in the American timber brought over to this country in the confined and heated holds of ships; its next step is a collecting together of the fibres of the vegetation into a more decided form, somewhat like hoar-frost; after which it speedily assumes the leathery, compact character of the fungus, forming into leaves, spreading rapidly in all directions and over all materials, and frequently ascending the walls to a considerable height, the colour variable—white, greyish white, and violet, light or decided brown, &c. To give a forcible idea of the serious extent to which this disease will attain when once it takes root and is left unarrested, we shall collect some scattered cases.

In the memoirs of Peppe, who was secretary to the Admiralty during the reigns of Charles II. and James II., reference is made to a commission which was appointed to inquire into the state of the navy, and from which it appears that thirty ships, called new ships, "for want of proper care and attention, had lost-stools growing in their holds as big as one's fists, and were in so complete a state of decay, that some of the planks had dropped from their sides." In the *European Magazine* for Dec., 1811, it is stated that, "about 1798, there was, at Woolwich, a ship in so bad a state, that the deck sank with a man's weight, and the orange and brown-coloured fungi were hanging, in the shape of inverted cones, from deck to deck." In the *Transactions of the Society of Arts*, vol. xxi. p. 294, we find that "an oak barn floor, which had been laid twelve years, began to shake upon the joists, and, on examination, was found to be quite rotten in various parts; the planks, 2½ inches in thickness, were nearly eaten through, except the outside, which was glossy, and apparently without blemish. The rotten wood was partly in the state of an impalpable powder, of a snuff-colour, other parts were black, and the rest clearly fungus. No earth was near the wood."

In timber which has been only superficially seasoned, and the heartward sap of which has never been discharged, this disease is produced internally, and has been known to convert the entire substance of a beam, excepting only the external inch or two of thickness to which the seasoning had penetrated, into a fine, white, and thread-like vegetation, uniting in a thick fungous coat at the ends, the semblance being that of a perfectly sound beam, thus serving as a mask to mislead the inexperienced. In this infernal rot, a spongy or fungous substance is formed between the fibres.

The first symptoms of rottenness in timber are swelling, discoloration, and mouldiness, accompanied with a musty smell; in its greater advance the fibres are found to shrink lengthways and break, presenting many deep fissures across the wood; the fibres crumble readily to a fine snuff-like powder, but retain, when undisturbed, much of their natural appearance.

The prevention of dry rot, or growth of fungus, has engaged the attention of scientific men for a very long period; and much floundering has there been in their meritorious endeavours towards accomplishing this desirable object. Some of the means tried, while calculated to prevent vegetation, were found to introduce evils as great as those they were intended to obviate; even now, although much has been achieved, it is to be feared it remains, in a great measure, a *pœnan questio*. The most favourite theory has been that of impregnating the pores of the wood with some such substance as should arrest putrefaction, and materials have sometimes been introduced for this purpose which produced an effect just the opposite of what was anticipated. About 1670 a Mr. Jackson, with a view to the prevention of decay, obtained permission to prepare some timber to be used in the national yards, by immersing it in a solution of salt water, lime, muriate of soda, potash, Epsom salts, &c., the result of which dose was, that the vessels built with it were rendered more perishable than if they had been constructed of unprepared timber. Between 1768 and 1773, a practice prevailed of saturating the timbers of ships with common salt, but this was found to cause a rapid corrosion of the iron fastenings, and to fill the vessels between decks with a continual damp vapour. Subsequently, muddle, found in the mines in Devonshire, was employed, in a state of fusion, to eradicate present, and prevent future growth; but whether its efficacy was proved by time, we have not been able to ascertain.

Quick-lime, with damp, has been found to accelerate putrefaction; but when dry, and in such large quantity as to absorb all moisture from the wood, the latter is hardened and rendered durable; vessels long in the lime-trade have afforded proof of this fact. White-wash or lime-water has been strongly recommended for use between the decks of ships, as being unfavourable to vegetation. Smoke-drying, oven-drying, scorching, and charring, have the effect of hardening wood, contributing to its durability, and preventing and destroying infection; but they may only be adopted with timber which has previously undergone a thorough seasoning. Steaming is also un-

derstood to prevent dry-rot. The piles supposed to have been driven by order of Julius Cæsar, when he forded the Thames at Cowey Stakes, near Shepperton, were charred; and when taken up some five-and-thirty years ago, were found in a complete state, free from decay. The incorruptibility of charcoal is well known, whether it be buried in the earth, exposed to the atmospheric action, or to that of water; the beams of the theatre of Hercules, which were reduced to that state by lava, were, after a period of nearly eighteen centuries, found to be perfect; the charred feet of posts which are put into the ground afford proof of its efficacy; the flag-ship, *Royal William*, at Spithead, built in 1719, the inner surface of the planks of which only were charred, was an example of great durability. Amongst other advantages, rats will not touch charcoal, neither will the white ants and cockroaches, so common in the Indies, commit their depredations where charring has been employed.

But the methods which have most engrossed the public attention of late years are those respectively distinguished as Kyan's, Payne's, Burnett's, patents, &c. In the years 1833 to 1836, at the Arsenal, Woolwich, experiments were instituted, having for their object the establishing or otherwise the claims of that first mentioned, and the results of which were of a very satisfactory nature: the Kyanised specimens generally, which were submitted to the fungus-pit, when taken out at the end of three years, being sound, while duplicate pieces, unprepared, were found in various stages of decay. Certain questions, however, presented themselves:—1st, Whether the impregnation to which the timber had been subjected might not be removable by some cause, and perhaps generate an atmosphere noxious and injurious to health. 2nd, Whether the strength of the timber were impaired or otherwise. The first was satisfactorily determined by Dr. Faraday, who proved by experiment that the combination was not simply mechanical but chemical, and that a permanently compound material was formed; the second was solved by experiments made by Capt. Alderson, C.E., upon ash and Christiania deal, and which showed that the rigidity of the timber was enhanced, but its strength in some measure impaired; its specific gravity being also somewhat diminished. Another question yet remains open:—how far, since the impregnation has not been traced to a depth greater than half an inch, does this process meet our requirements? and, after the satisfactory conclusion arrived at, as above related, and the evidence of the facts upon which it was so reasonably founded, how are we to meet the assertion of Mr. Pritchard, C.E., of Shoreham, made in 1842?—"The sleepers Kyanised five years ago, and in use at the W. I. Dock warehouses, have been discovered to decay rapidly; and the wooden tanks at the Anti-Dry-Rot Company's principal yard are decayed;" but more from this gentleman hereafter. Mr. Kyan's infusion is corrosive sublimate, and the process consists in submerging the timber in tanks for about a week, then taking it out and drying: Sir Humphrey Davy had previously recommended a weak solution of the same thing, to be used as a wash where rot had made its appearance. Dr. Birkbeck made a favourable exposition of the process as pursued by Mr. Kyan; Sir John Barrow and the Duke of Portland impugned it; and Lord Manners and Dr. Moore follow on the same side. The Payning process, besides professing to preserve timber from dry-rot and the ravages of insects, is said to render it unflammable, or at least to deprive it in a great measure of combustibility.

JAMES WYELSON.

ALTAR-PICKE, ST. JAMES'S CHURCH, BIRMINGHAM.—About seventy sketches, it is said, were submitted to the committee in reply to their advertisement. The successful competitor is Mr. John Wood, of Charlotte-street, Fitzroy-square. After the picture is painted, however, the premium will not be paid, unless referees, to be appointed, shall pronounce it worth the sum offered, 500*l*.

STATUE OF PRINCE ALBERT.—A committee of the most influential merchants of the city is in course of formation to erect by subscription a full-length marble statue of Prince Albert, in the Royal Exchange, in commemoration of his having laid the first stone.